

Resting Pd/Pa measured with intracoronary pressure wire strongly predicts fractional flow reserve.

Abstract

OBJECTIVE:

To investigate the relationship between resting distal coronary pressure to aortic pressure ratio (Pd/Pa) and fractional flow reserve (FFR) obtained during maximal hyperemia.

BACKGROUND:

FFR is an invasive index of the functional severity of a coronary artery stenosis determined from coronary pressure measurements. It is generally believed that there is little correlation between resting Pd/Pa and FFR obtained during maximal hyperemia. We have therefore studied this relationship in a large cohort of patients who had undergone pressure-wire assessments.

METHODS:

528 consecutive pressure-wire studies performed in 483 patients over a 2-year period were retrospectively analyzed.

RESULTS:

A linear correlation between resting Pd/Pa and FFR post-pharmacological hyperemia was observed ($\rho = 0.74$; $p < 0.0001$). When a FFR of ≤ 0.75 (or ≤ 0.80 as per FAME) was defined as positive, a resting Pd/Pa of ≤ 0.85 (≤ 0.87) had a positive predictive value (PPV) of 95% (94.6%), while a resting Pd/Pa of ≥ 0.93 (≥ 0.96) had a negative predictive value (NPV) of 95.7% (93%).

CONCLUSIONS:

We demonstrate a strong correlation between resting Pd/Pa and FFR. Resting values of Pd/Pa can be used to predict a positive FFR result with relatively high PPV and NPV. This may potentially obviate the need for adenosine infusion in a proportion of pressure-wire studies.